Typography and Education
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LEARNING AID IN BRAILLE AND TYPOGRAPHY

Innovative educational applications of Braille and Typography for children
(An ongoing research project)

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Abstract: Communication is the most important aspect in the human world. The main objective of this project is to use braille and typography together and provide an educational aid for the blinds, using the existing braille script.
In the world of visuals we have various typefaces but in braille there is no such variety available. Various techniques were experimented before the invention of braille script. But have unfortunately not succeeded.

The main idea behind this project is to derive a piece of a hardware to use to teach the visually challenged children for future communication purpose.

The following questions arise in one's mind-

1. Why relate braille and typography with learning?

2. Aren't the new innovative technologies supporting the braille methods of learning alphabets?

Developing new way of learning braille with introduction of graphic symbols can fill this lacuna in the field of communication. Typography although not referred with technical aspects considering the visuals still has weightage with basic san-serif letterform learning for blinds.

Key words: Educational aid, Braille and typography, Book for learning basic alphabets, ongoing research project.

1. Introduction

Typography is the art and technique of arranging type to make written language legible, readable, and appealing when displayed. The arrangement of type involves selecting typefaces, point size, line length, line-spacing (leading), letter-spacing (tracking), and adjusting the space within letters pairs (kerning).

Braille is a tactile writing system used by people who are blind and low vision. It is traditionally written with embossed paper. Invented in 1821 by blind Frenchman Louis Braille. The blind can write braille with the original slate and stylus or type it on a braille writer, such as a portable braille note-taker, or on a computer that prints with a braille embosser.
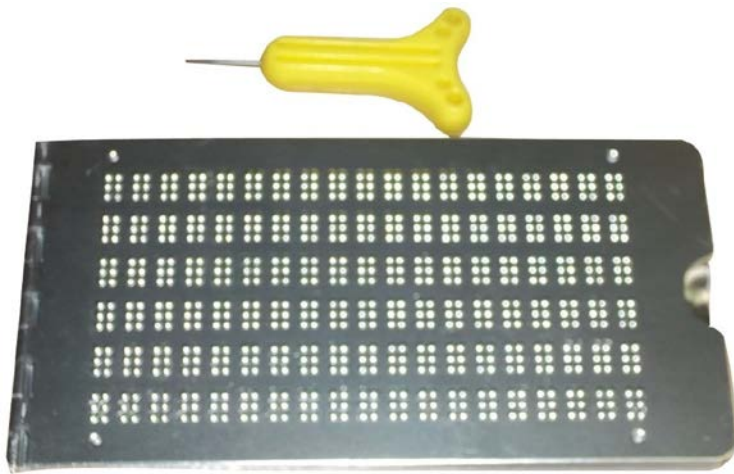

Image 1.

Modern braille slate with stylus.

Origin: It is believed that the braille script is derived with embossed pattern style from the ancient Egypt script: hieroglyphics.
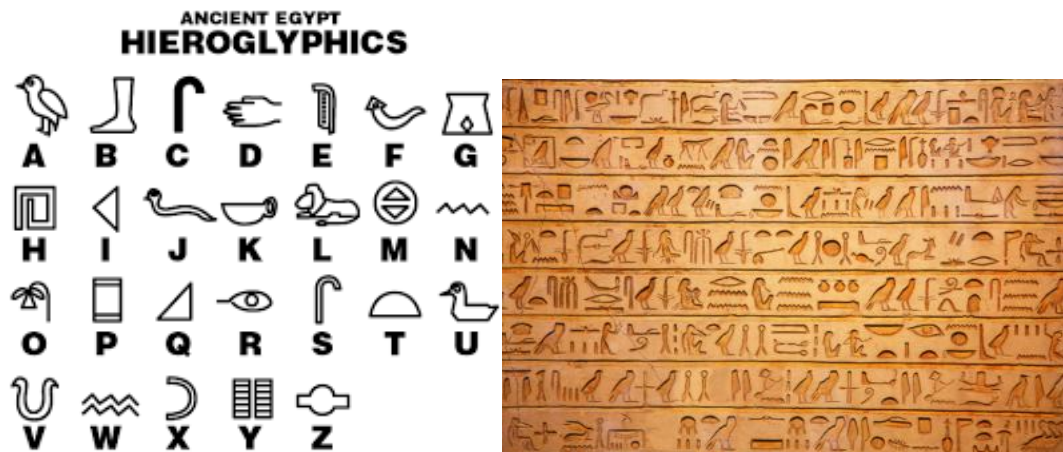

Image 2.

The germ for symbolizing the alphabets by just a placement of dots in their respective cells.

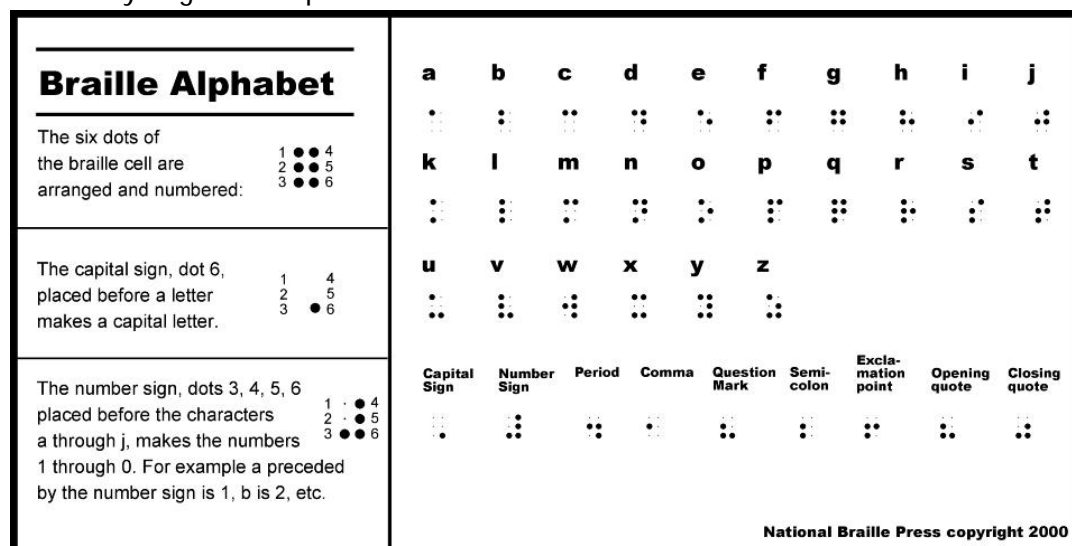The study begins with placement of raised dots in a cell.

Image 3.

Learning methods: The primitive methods of teaching braille are indifferent as the modern ways. Unfortunately there is no such major change observed. Object identification is a difficult process to follow where discomfort was seen for all objects of learning.

Motivation: Providing the path for the further access for the project. Creating a study material that could be a way to teach the blind children from kinder garden up to VIII grade.

Combination of braille and graphic symbols is important point.

Problems:

1. Difficulty in understanding the embossed picture as a whole.
2. Change in the traditional braille slate pattern considering leading and tracking.
3. Space distribution.

1. The below is the embossed picture of shell, but it is difficult for a blind child to understand the pattern due to minute detailing.

Image 4.

Embossed Shell with details.

2. Any change in the traditional braille slate pattern can lead to misguide learning and make children difficult to fundamentals of learning.
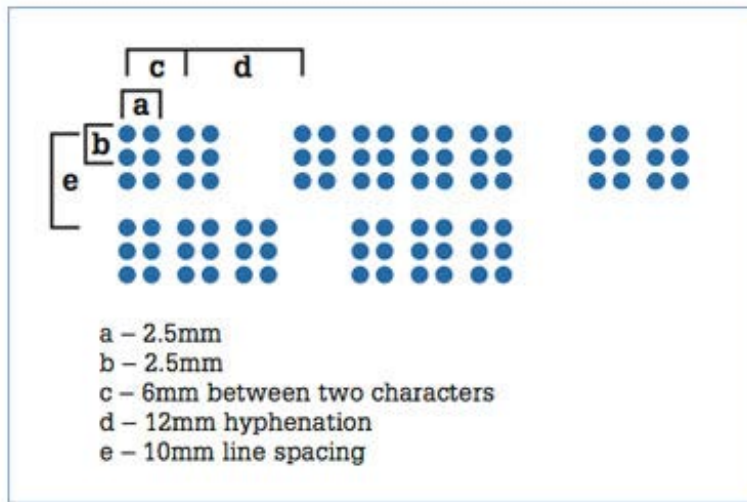

a – 2.5mm
b – 2.5mm
c – 6mm between two characters
d – 12mm hyphenation
e – 10mm line spacing

Image 5.

3. A minute change in the space distribution can make the child blank with reading and writing ability pace.

Image 6.

Statement: There is clearly a gap, which needs attention. The lack of available technology, lack of standardization or inadequate implementation of standardization have been long standing problems in the field of learning basic alphabets in braille along with symbols.

To overcome these obstacles an experimentation was conducted using the **existing braille script** and **creating graphic symbols in braille itself**. So as to provide easy and comfort for the blinds to identify new symbols and learn.

Aim and Objectives: As mentioned earlier the main aim of this project is to provide educational study material for the children from kinder garden up to VIII grade.

Perception towards this project motivates to derive simple graphic icons which are traditionally drawn. For visuals we have plenty of study material according to our convenience. But unfortunately there is lack of basic study elements for blinds to learn.

Image 7.

Easy basic alphabet charts for visuals to learn.

Problem Definition: The visual charts are easy to deliver as they are in 2dimensional form but for blinds they need to be in embossed 3dimensional pattern. The current syllabus teaches the object with sensory learning methodology were the children are made to touch the objects.

E.g. A for Apple (realistic apple given to touch)

But the issue is it is not possible in all cases for words such as knife, lion, volcano, etc.

Here the key idea is to approach the problem and to find a way out of this by providing a handy and comfortable book with embossed structures.

An attempt to develop a structural educational medium is done in this project.

Approaches: Various approaches were used to experiment while teaching the child. For smaller objects like apple, flower it was easy to give him for sensory learning but it was difficult for larger objects like aeroplane, elephant, etc. Therefore each object had to be vectored in simplest form and then converted into braille symbol.

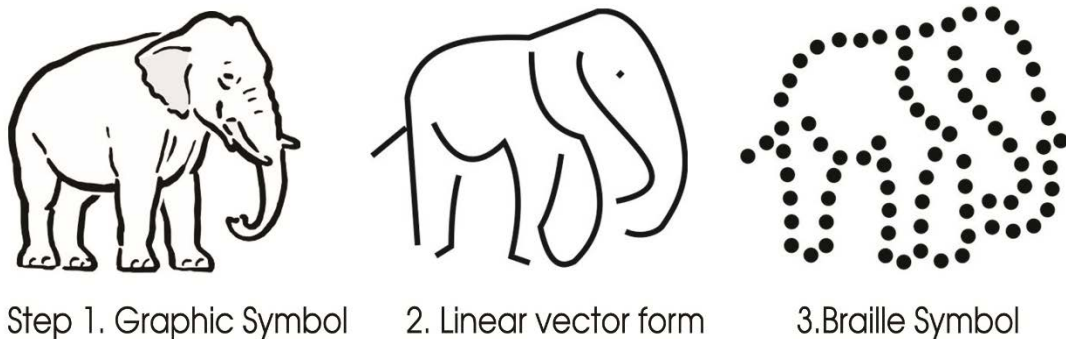E.g. Realistic Elephant converted into simplest graphic with essential characteristics and then into braille symbol.

Step 1. Graphic Symbol   2. Linear vector form   3. Braille Symbol

Image 8.

Likewise all the Alphabets with four symbol each were made and experimented on the blind children.

Another important way of introducing the visual letterforms was a challenge in this project. But after experimenting with the blind and partial blind it was confirmed that it was providing an ease for the child to understand and differentiate the counter space, uppercase and lowercase.

Below are the contents of the braille book.

1. The braille letter **A** (braille point positioning 1)
2. Roman letter (uppercase and lowercase) for future communication purposes.
3. Word **APPLE** in braille followed by healthy spacing.
4. Symbol of graphic apple with same braille space and measurements.

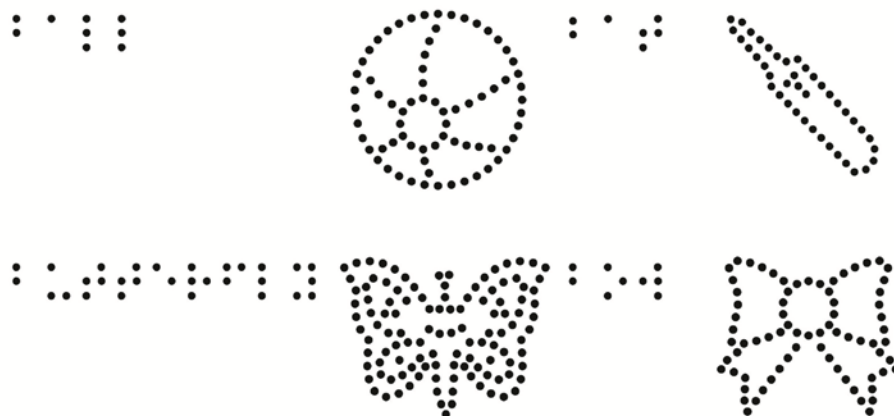Followed by the successive alphabets with braille leading pattern- Two line space for new beginning.
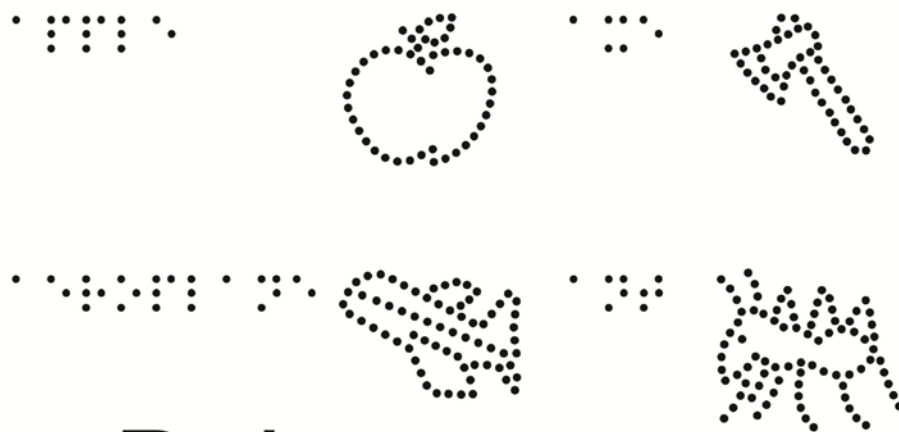
Image 9.

Advantages:

1. For basic book to study, ease for children to learn the alphabets with symbols.
2. Compilation of visual alphabets to provide an introduction and letter identification for future use.
3. Basic guide to identify objects and shapes to learn larger objects too.
4. Sufficient space to learn and enhance their sensitivity skills and grasping power.
5. Measurements following the braille slate there by giving same reading pace and convenience for the child.

Elements of Abstract:

1. Does it provide a new approach?

Considering the primitive learning patterns and techniques this projects adds on to a comfort level for mentor and child as simultaneous learning of word and symbol is achieved.

Individual cut outs have to be made to explain the word and its shape where as it is difficult on mass production.
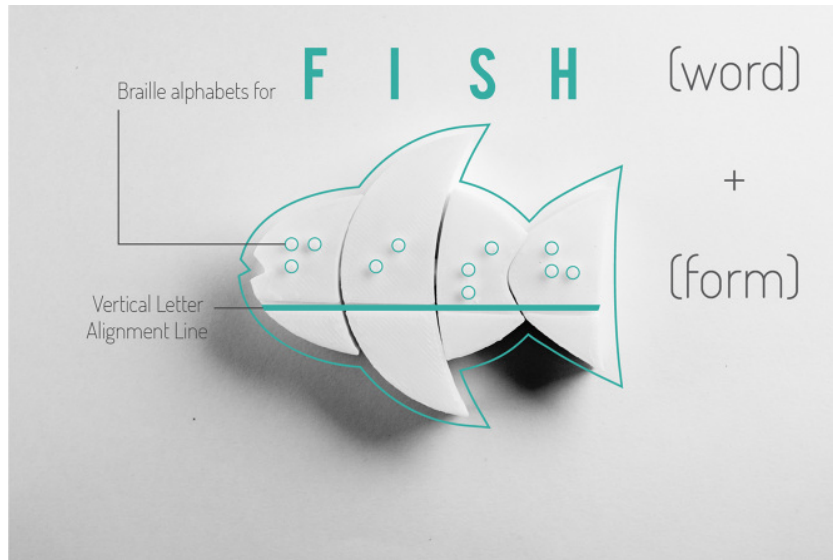
 Image 10.

Primitive way of teaching blind the objects not suitable for mass production.

Whereas it is easy to teach the word and symbol separately with same braille technique.
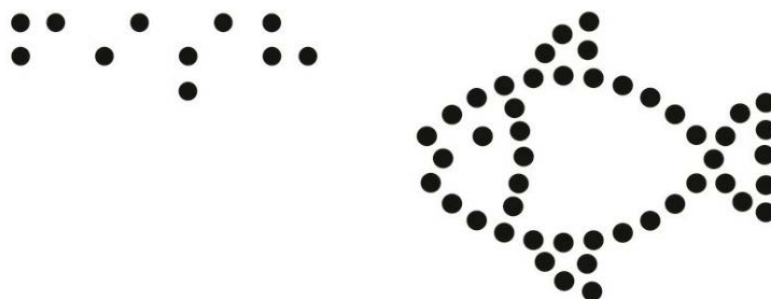

Image 11.

Developed way of teaching.

2. Why it should be considered as innovative educational application?

Considering the deficit in the teaching approach this project will partially help the blinds to become an individual learner with respect to their academic and daily objects identification.

Also it describe a piece of hardware for mass production level to provide a basic braille learning book.

Process for mass production: For easy access and availability the entire project is processed in metal cast dyes for permanent production.
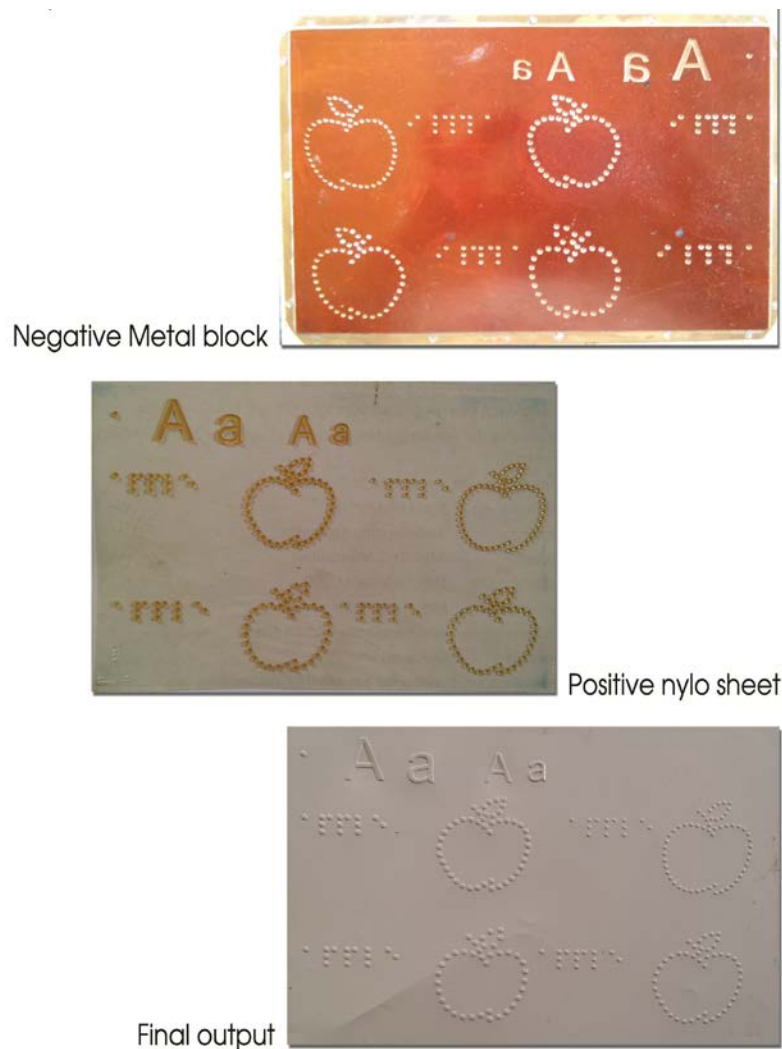

Image 12.

The Project is been approved by KAMLA MEHTA SCHOOL FOR BLIND, DADAR, INDIA.

SMT. KAMLA MEHTA DADAR SCHOOL FOR THE BLIND
(Founded 1900)

160, Dadasaheb Phalke Road, Dadar (East), Mumbai-400 014.
(REGISTERED UNDER BOMBAY PUBLIC TRUST ACT XXIX OF 1950 - F/232 (B)
Management : Blind Relief Association)

Ref. No. D.S.B. 919/15/H.D

Date : _____

To,
Siddhesh sushil shirsekar
Sir J.J institute of applied art,
Fort, Mumbai.

Date: 08th January 2015

Subject: Covering letter for project for blind students And project approval.

This covering letter mentions that Mr. Siddhesh Sushil Shirsekar, final year B.F.A from Sir J.J institute of applied art 2014-15, Fort, Mumbai. He is launching a new project in Braille script which is very useful to basic concepts of the subjects of the subject for blind children.

He is working on this project since months with proper approvals from the school faculties and authorizes. His project is now approved by our school and will be implemented in 'Kamla Mehta school for the Blind's first time and will be launched shortly.

We ask for word of appreciation and request to co-operate and grace the project to make it a grand success.

Thank you,

Yours truly,

(Smt. Uma Mumbaikar)
Principal

PRINCIPAL
SMT. KAMLA MEHTA DADAR
SCHOOL FOR THE BLIND
160, DADASAHEB PHALKE ROAD,
DADAR (EAST), MUMBAI-400 014.

Image 13.

Future plans: In a nutshell this project will be helpful for the blind students in order to become an individual learner with respect to their academic as well as the day to day objects identification i.e. for the visual alphabets.
Providing an aesthetic view to sense towards various objects and making the learning process more interactive.
With ongoing research project various strategies could be implemented with respect to **TOOLS, MEDIUMS, and SURFACES WITH WORD EXPRESSIONS.**

Conclusion: By taking into consideration the whole methodology has been developed under the criteria of 'Braille and Typography' which is testified research. The possibilities are infinite and never ending process. And there is always scope for development in the existing research paper for self-development and society.

We need to develop educational/ reference material for blinds to develop educational aid. A standardized approach needs to be developed rather than giving temporary solutions.

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Mrs. Kunda Ajgaonkar- Principle of Smt. Kamla Mehta School for the Blind, India.

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National Braille Press copyright, India.

NAB (NATIONAL ASSOCIATION FOR THE BLIND), India.

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https://en.wikipedia.org/wiki/Braille

https://www.microsoft.com/en-us/Typography/default.aspx

http://designinstruct.com/tools-basics/the-basics-of-typography/